

We Claim:

- 1 1. A graphics system, including:
  - 2 a graphics pipeline;
  - 3 an embedded frame buffer; and
  - 4 an arrangement that reconfigures the embedded frame buffer to store
  - 5 image data in either RGB color format or YUV luma/chroma format.
- 1 2. The graphics system of claim 1, wherein the graphics pipeline writes
- 2 image data to the embedded frame buffer in the RGB color format, and the system
- 3 further includes an external processor coupled to the embedded frame buffer that
- 4 writes image data in YUV format to the embedded frame buffer.
- 1 3. The graphics system of claim 1, wherein the arrangement that
- 2 reconfigures the embedded frame buffer operates in response to an application
- 3 command.
- 1 4. The graphics system of claim 1, wherein the embedded frame buffer is
- 2 reconfigurable on a frame-by-frame basis.
- 1 5. A graphics processor, including:
  - 2 image processing circuitry; and
  - 3 an embedded frame buffer;
  - 4 wherein the embedded frame buffer is selectively configurable to
  - 5 received data in any of the following formats:
    - 6 - point sampled color and depth;

7 - super-sampled color and depth; and

8 - YUV.

1 6. The graphics processor of claim 5, wherein the point sampled format is a

2 48-bit format and the super-sampled format is a 96-bit format.

1 7. The graphics processor of claim 6, wherein the 48-bit format includes 24

2 color bits and 24 depth bits.

1 8. The graphics processor of claim 7, wherein the embedded frame buffer is

2 further configurable such that the 24 color bits selectively include either 8 bits for

3 red, 8 bits for blue and 8 bits for green (RGB8) or 6 bits for red, 6 bits for green, 6

bits for blue and 6 bits for alpha (RGBA6).

1 9. The graphics processor of claim 7, wherein the 96-bit format includes

2 color and depth data for three super-sample locations for a pixel.

1 10. The graphics processor of claim 9, wherein the super-sample color data

2 is 16 bits and the super-sample depth data is 16 bits.

1 11. The graphics processor of claim 10, wherein the 16 bit super-sample

2 color data includes 5 bits for red, 6 bits for green and 5 bits for blue (R5G6B5).

1 12. The graphics processor of claim 5, wherein the YUV format is a YUV

2 4:2:0 format.

1 13. The graphics processor of claim 5, wherein the embedded frame buffer

2 is a dynamic random access memory (DRAM).

1 14. A graphics system, comprising a graphics chip having graphics  
2 processing circuitry and an embedded frame buffer for storing frame data prior to  
3 sending the frame data to an external location, wherein the embedded frame buffer  
4 is selectively configurable between the following pixel formats:

5 - RGB8 and 24 bit Z;  
6 - RGBA6 and 24 bit Z;  
7 - Three R5G6B5 color and 16 bit Z super-samples; and  
8 - YUV 4:2:0.

1 15. The graphics system of claim 14, wherein in the YUV 4:2:0  
2 configuration, a color buffer of the embedded frame buffer is partitioned to store  
3 720x576 Y, 360x288 U and 360x288 V image planes for a YUV 4:2:0 frame.

1 16. The graphics system of claim 15, wherein the color buffer partitioning  
2 allocates as follows:

3 - 1024x640 8 bit Y image;  
4 - 528x320 8 bit U image; and  
5 - 528x320 8 bit V image.

1 17. The graphics system of claim 14, further including an interface to the  
2 graphics system that enables a programmer to selectively configure the embedded  
3 frame buffer.

1 18. The graphics system of claim 17, wherein the interface enables the  
2 embedded frame buffer to be reconfigured on a frame-by-frame basis.

1 19. In a graphics chip having pixel processing circuitry and an embedded  
2 frame buffer for storing pixel data prior to transferring the pixel data to an external  
3 destination, an improvement comprising:

4 a reconfigurable embedded frame buffer which can be selectively  
5 configured to store any of the following pixel formats:

6 - 48 bit point sampled color and Z;  
7 - 96 bit super-sampled color and Z; and  
8 - YUV.

1 20. The graphics chip of claim 19, wherein the embedded frame buffer is

2 further selectively configurable to store the following 48 bit formats:

3 - RGB8 and 24 bit Z; and  
4 - RGBA6 and 24 bit Z.

1 21. The graphics chip of claim 19, wherein the 96 bit super-sampled

2 format includes three super-samples each having a R5G6B5 color and 16 bit Z  
3 format.

1 22. The graphics chip of claim 19, wherein the YUV format is a YUV

2 4:2:0 format.

1 23. A method of using an embedded frame buffer in a graphics system,  
2 including the steps of:

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3 providing an embedded frame buffer that is selectively  
4 configurable to store image data in either RGB color format or YUV color  
5 format; and

6 providing an interface to the graphics system which controls the  
7 configuration of the embedded frame buffer.

1 24. The method of claim 23, further including enabling the interface to  
2 selectively configure the embedded frame buffer on a frame-by-frame basis.

1 25. The method of claim 23, further including enabling the RGB color  
2 format to be configured as either a 48-bit point sampled color and Z format or a  
3 96-bit super-sampled color and Z format.

1 26. The method of claim 25, further including enabling the 48-bit format to  
2 selectively include an RGB8 and 24 bit Z format or an RGBA6 and 24 bit Z  
3 format.

1 27. The method of claim 25, further including defining the 96-bit super-  
2 sample format to include three super-samples each having a R5G6B5 color and 16  
3 bit Z format.

1 28. The method of claim 23, further including defining the YUV format as  
2 a YUV 4:2:0 format.